



Space News Roundup

Vol. 30

April 19, 1991

No. 15

Space Center Houston takes gigantic stride

By Kelly Humphries

Space Center Houston took a giant stride forward this week when eager investors snapped up more than \$68 million worth of tax exempt bonds that will finance the new JSC visitor center.

A news conference was planned to announce the sale to the public this morning.

"We have sold our bonds," said Harold S. Stall, JSC's director of Public Affairs and president of the non-profit Manned Space Flight Education Foundation Inc. that is developing the facility. "Space Center Houston is no longer just a dream."

Stall said construction of the 183,000-square-foot, multi-level building will begin the last week of May. The "experience center," designed by Walt Disney Imagineering, will be built on 123 acres at JSC's main gate.

The bond sale resolves the question of funding, which has followed a sometimes torturous route since the new visitor center was proposed in 1985. In addition to the \$68 million in bonds, the Manned Space Flight Education Foundation will use \$10 million appropriated by Congress.

"This is a great moment," said Vance Ablott, general manager of Space Center Houston. "It has taken a long time and the efforts of Bill Kelly, Hal Stall, Hank Flagg and Aaron Cohen putting this thing together have been tremendous. Now they get to watch me build it."

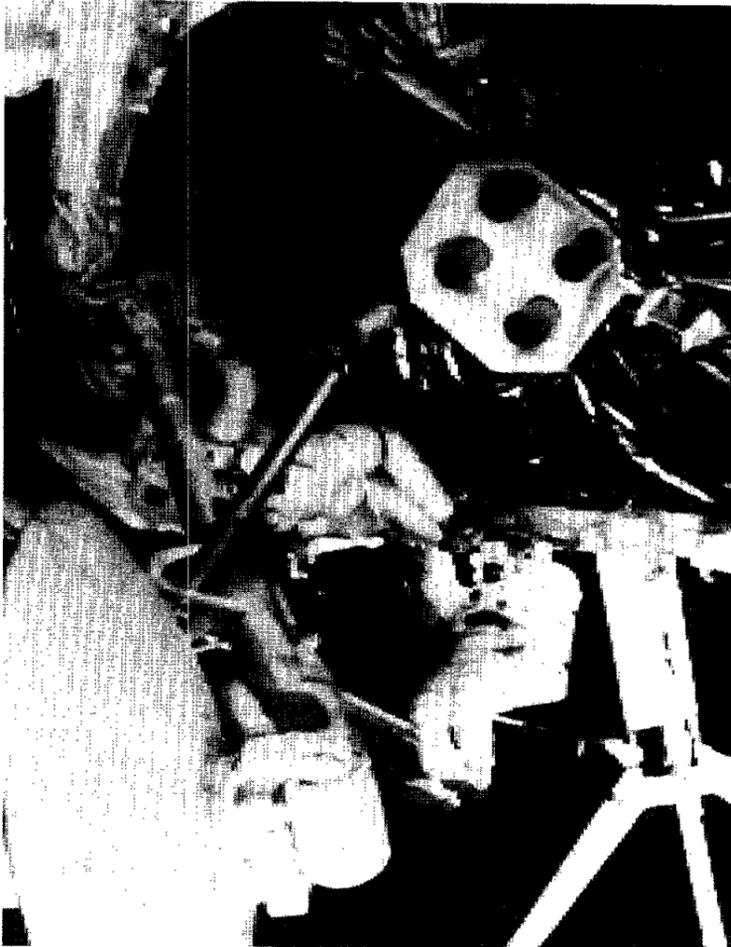
Ablott said many changes will be visible during the next two weeks as the contractors prepare to build.

"We could be open sometime in the fall of '92," Ablott said.

The center's design will allow more than 6,500 visitors per hour to feel like "insiders" at JSC through experiences, live demonstrations, live coverage of on-going missions, big format film and video, historical exhibits and a tram tour. Admission will be about \$5 a person, and 2 to 3 million people are expected in the first 12 months.

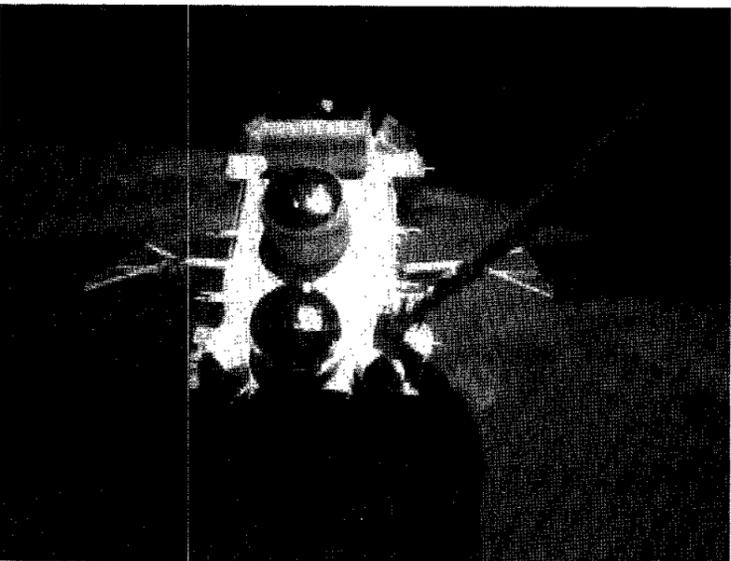
"We're obviously very pleased, not only with the enthusiasm for the bond offer, but with the very attractive interest rate that was obtained," Stall said.

Stall said the 9.4-percent-interest bond issue was fully subscribed within a matter of hours when it was introduced to the market Tuesday.



NASA Photos

Above: With a quick shake, STS-37 Mission Specialist Jerry Ross frees the boom of the Gamma Ray Observatory's high-gain antenna during the first unscheduled space walk in six years. Below: GRO waits between Atlantis and Earth for robot arm operator Linda Godwin to set it free. Godwin released the observatory at 5:38 p.m. CDT Sunday. Commander Steve Nagel safely landed at 8:55 a.m. Thursday at Edwards Air Force Base.



Space walkers fix observatory's stuck antenna

By Kelly Humphries

Two space walking repairmen needed only 17 minutes to shake loose a stubborn antenna Sunday on the Gamma Ray Observatory and pave the way for scientists to study the cosmic processes that made it possible for them to be there.

Mission Specialists Jerry Ross and Jay Apt stepped out of *Atlantis'* hatch about 1:40 p.m. CDT Sunday after the 17 1/2-ton observatory's high-gain antenna rebuffed six release attempts by ground controllers. It was only the second unscheduled extra-vehicular activity in space shuttle history and the first space walk in five years.

"It's free, it's free!" Ross exclaimed after he "just kind of shook on the side of the boom."

After getting a head start on the next day's space

walk tests, Ross and Apt watched from inside the shuttle airlock as the second of NASA's Great Observatories was released by Mission Specialist Linda Godwin, at the remote manipulator system controls, at 5:38 p.m.

GRO will study the universe's high-energy events in the gamma ray wavelength, providing a reliable record of cosmic change and evolution. It will study the structure and dynamics of the Milky Way galaxy, the nature of pulsars, quasars, black holes and neutron stars, and the processes that may have taken place shortly after the universe began in the theoretical "Big Bang" explosion. It will also study supernovae and novae where heavy elements, including those that are the basis for life as we know it, are believed to be formed.

"I'm just thankful there was man in the loop here," said Goddard Space Flight Center's John Hrastar, GRO project manager.

"The value of manned space flight was shown today and it was shown to be very effective," agreed STS-37 Lead Flight Director Chuck Shaw,

exhausted after a 16-hour day shift that every member of his team volunteered for. "We're real proud of the crew."

Atlantis lifted off from Kennedy Space Center's pad 39B at 8:23 a.m. CST Friday and touched down on Edwards Air Force Base runway 33 at 8:55 a.m. CDT Thursday. The mission was 5 days, 23 hours, 32 minutes long because unacceptable weather in both California and Florida delayed the landing by a day.

Ross and Apt returned to the open vacuum of space on Monday, testing techniques for moving along the outside of Space Station *Freedom* with the help of various translation devices. Using a specially designed Crew Equipment Translation Aid cart, the pair took turns moving along a

47-foot monorail in the payload bay by manual, mechanical and electrical power.

"Boy, this thing glides slick, it really does," Apt said.

"This is the way to travel around the world," Ross replied. "Virtually no effort's required here. You could move hundreds and hundreds of feet this way without getting tired."

All three of the carts worked well, they said, but the manual, hand-over-hand cart worked best.

Apt also spent time at a tool bench, measuring the forces involved in standard extravehicular activity tasks with the Crew Loads Instruments Pallet Experiment, and Ross took a ride on the robot arm's manipulator foot restraint to evaluate how such arms can be used to assist EVA astronauts working on the space station.

All of the Extravehicular Activity Developmental Flight Experiment were managed by JSC's Crew and Thermal Systems Division.

Sunday's unscheduled space walk lasted 4 hours, 38 minutes, and Monday's added 6 hours, 11

Please see **ATLANTIS**, Page 4



Sonny Carter dies in plane crash

Versatile astronaut will be 'sorely missed'

Astronaut Sonny Carter was killed last Friday in the crash of a commuter aircraft at Brunswick, Ga., but his work leaves an important legacy for America's space program.

JSC flags flew at half staff for the 43-year-old Navy captain this week, and friends and co-workers joined his wife, Dana, and daughters Olivia Elizabeth and Meredith Corvette for a memorial service Tuesday at University Baptist Church.

"He was a really competent, hard working, personable guy and he'll leave a big hole here," said Dan Brandenstein, chief of the Astronaut Office. "Sonny's friendly, helpful personality touched all with whom he associated. Likewise, his exceptional technical expertise and versatility resulted in many contributions to all aspects of our

nation's space program. Sonny was one of a kind and he will be sorely missed."

Carter joined NASA in 1984 as an astronaut candidate and became a mission specialist in 1985. He was the astronaut representative on numerous NASA projects involving extravehicular activity and human physiology.

In November 1989, Carter flew aboard the Space Shuttle *Discovery* on STS-33, a Department of Defense mission. At the time of his death, he was preparing for his second space flight on STS-42, the first International Microgravity Laboratory mission scheduled for January 1992.

"Sonny had many things that filled his life," said Fred Gregory, who commanded STS-33. "He did more

Please see **SONNY**, Page 4



NASA Photo

Astronaut Sonny Carter tries his feet at zero-G soccer during STS-33. The astronaut, a Navy captain and a medical doctor, also played professional soccer with the Atlanta Chiefs of the North American Soccer League.

Shuttle buses will cruise for STS-1 salute

A large crowd is expected to celebrate the 10th anniversary of the first space shuttle mission at JSC Monday.

The celebration, patterned after the traditional crew return parties, will be from 4:30-8:30 p.m. April 15 on the south parking lot of the Gilruth Center. A short ceremony at 6 p.m. will honor the STS-1 crew.

Because attendance is expected to be more than 2,700, continuous shuttle bus service to and from the Gilruth will be provided from 3:30-9:30 p.m. Employees going directly from their work areas to the Gilruth are encouraged to use the bus service.

The bus route will circle the JSC perimeter along Avenue B, Fourth Street, Fifth Street, Avenue D and Second Street. Buses will stop at

Please see **STS-1**, Page 4

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays.

General Cinema (valid for one year): \$4.
AMC Theater (valid until May 1992): \$3.75.
Loews Theater (valid for one year, can be used two weeks after premiere): \$4.

Astroworld (valid 1991 season): season, \$44.94; children under 4 feet, \$10.12; one day, \$15.85; Waterworld, \$8.13.

Seaworld of Texas (valid 1991 season): child (3-11), \$12.25; adults, \$17.25.
Galveston Historical Homes Tour (May 4, 5, 11 or 12): \$11.

JSC Picnic: (May 4, Gilruth Center, includes barbecue dinner, children's rides and carnival games, entertainment, refreshments, bingo and laser show): children, \$2.50; adults, \$4.

JSC

Gilruth Center News

EAA badges—Dependents and spouses may apply for a photo I.D. 6:30-9 p.m. Monday-Friday. Cost is \$5.

Defensive driving—Course is offered from 8 a.m.-5 p.m., June 15, July 13 and Aug. 10. Cost is \$15.

Aerobic dance—Class meets 5:15-6:15 p.m. Tuesday and Thursday nights. Cost is \$24.

Exercise class—Class meets 5:15-6:15 p.m. Monday and Wednesday nights. Cost is \$24.

Weight safety—Required course for employees wishing to use the Gilruth weight room. The next class will be from 8-9:30 p.m. April 25. Cost is \$4.

Ballroom dance—Beginner and intermediate ballroom dancing lessons will be offered for eight-weeks from 7-8:15 p.m. Thursdays beginning May 2. Advanced lessons will be offered from 8:15-10 p.m. beginning May 2. Cost is \$60 per couple.

Almost Anything Goes—Six teams needed for JSC Picnic competition. Cost is \$10 per six-person team. Registration deadline is 7 p.m. April 25.

Softball tournament—Men's open "C" softball tournament will be April 27-28; \$95 per team. Registration deadline is 7 p.m. April 25.

Intercenter Run—Two-mile and 10K runners may record their times throughout April outside Gilruth Rm. 146.

JSC

Swap Shop

Property

Rent/Lease: CL condo on marina, three level, all appl, FPL, wet bar, 2-2.5-2, \$950/mo. 474-4922.

Sale: CL, Oakbrook West, 4-2-2.5, ex cond, FPL, both formals, wet bar, new paint, close to NASA, \$119K. 486-5220.

Sale: Res restricted lot, all util avail, Magnolia, TX area, \$10K OBO. Rob, x33484.

Rent: Lake Travis cabin, private boat dock, C/AH, fully equip, accom 8, wkly/dly, \$325/\$380. 326-5652.

Rent: Univ Trace condo, 2-2, W/D connect, FPL, res parking, nonsmoking, x38889 or 480-1340.

Sale: West Bay, Bayou Vista lot, good bulkhead, \$6950. 339-1957.

Sale: Bay Glen, 3-2.5-2, huge deck, custom draperies, ex cond, \$150.9K, x30554 or 486-4369.

Lease: 2-1.5 condo 5 min from NASA, new paint/carpet/blinds, all appl, W/D, \$475/mo plus dep. Lori, x34718 or Mike, 554-2601.

Rent: Galveston condo, turn, sleeps six, Seawall Blvd and 61st St, wkly/wknd/dly rates, cable TV, swimming pools. Magdi Yassa, x33479 or 486-0788.

Sale: Pipers Meadow, 3-2.5-2, formal LR/DR, FPL, loft, wet bar, fans, gar door opener, deck, landscaped, new paint, 15 min to JSC, \$90K. Dennis, x34405 or 480-5076.

Sale: Dickinson, '75 Supreme Chalet mobile home, 2-1.5, 12' x 60', \$7K, owner fin avail. x33139 or 534-2288.

Sale: El Lago, 4-2.5-2. Guy, x32800 or 532-3413.

Sale: Lake Livingston lot, 81' x 140', west side north of Cold Springs, near lake and boat ramp, formerly Holiday Shores subdiv. T. Ward, 488-5445.

Sale: Bacliff 3-2-2 detached, two story brick on fenced corner lot, C/AH, 6" stud walls, den, lots of closet space, \$49.5K. 559-1341.

Sale: Two water view lots near NASA, \$38.5 ea; bayfront lot on Todville, \$125K. Don, x38039.

Sale: Nassau Bay 4-2.5-2 w/study, both formals, 2600 sq ft, spa, sprinkler sys, \$145K. 333-2827.

Sale: CL 2-story condo, 1-1.5-1CP, patio, balcony, all appl, alarm, fan, FPL, \$38K, assum. 486-0508.

Sale: Egret Bay Villa, 1 BR on water, W/D, microwave, FPL, boat incl, \$43K. Sean, 480-8190 or 996-7693.

Cars & Trucks

'76 BMW 2002, \$3500; '80 Olds Omega, \$1000; '85 Chrysler LeBaron GTS, \$4000. George, x35398 or 474-7021.

'80 Chevy Camaro, V6-229, \$1250 OBO. 286-5928.

'89 T-Bird, white, 2 dr, 4 spd auto, new tires, loaded, V6, 40K mi, \$9000. 333-6320 or 996-0996.

'79 Olds Delta 88, 4 dr, lint, new tires, V8, all pwr, tan, ex cond, \$1850 OBO. 339-1337.

'87 Toyota Corolla FX16, red, 53K mi, 4 cyl, 5 spd, PS/PB, A/C, tint, cloth int, cruise, AM/FM/cass, new exhaust, alternator, ex cond, \$5600. x31689 or 480-2467.

'84 M318i Eurosport, 49K mi, new Alpine white paint and BBS wheels, carpet, tires, rear spoiler and ground effects, \$10.5K. x31175.

'82 Honda Civic, 3 dr hatchback, good cond, \$2500. 332-0146.

'88 Suzuki Samurai, removable hard top, new soft top, 42K mi, assum, \$227/mo OBO. x38843 or 332-6153.

'89 Ford Econoline van, 36K mi, Tra-Tech Diamond ed, 6 cyl, ex cond, \$12.8K. (409) 925-4743.

'85 Ford F-150 Supercab, A/C, auto, 6 cyl, 300 CID, toolbox, good cond, \$3895 OBO. Hugo, 286-0432 or 335-2552.

'84 Olds Ciera 4 dr, AM/FM/cass, auto, A/C, tint, rear defrost, wire hubs, 6 cyl 3.0L, good cond, \$2850. Ron, 335-2465 or 332-4302.

'86 Toyota 4X4 PU, good cond, \$7500 OBO. 992-3447.

'87 Ford Tempo GL, std, blk w/red int, 4 dr sedan, 75K mi, ex cond, \$3500. 538-1051.

'81 Chevy Impala 4 dr, A/C, PS, PB, auto, \$1995 OBO. 481-2665 or 280-2459.

'85 Buick Century Ltd, V6 3.0L, loaded, maroon/red, 4 dr, good cond, \$2500 OBO. x39289 or 487-3216.

'83 Monte Carlo, \$3500 OBO; '84 Mustang, \$3000 OBO. Gretchen, 283-0446 or 482-6744.

'74 Cadillac 2 dr, \$600. 333-2395.

'82 Mercury Marquis, 4 dr sedan, 5L, V8, all pwr, good cond, \$1450. Dominic, 996-9249 or Susan, x31683.

'84 Mustang GT convert, red/black, new clutch, tires, muffler, ex cond, \$6000; '83 Porsche 928s, 57K

mi, auto, sun roof, alarm, all pwr, ex cond, \$15K. Gloria, 480-0235 or 485-7555.

'84 VW Rabbit, needs eng, all else good cond, BO. 283-5843.

'82 Pontiac Bonneville wagon, ex cond, all pwr, cruise, tilt, AM/FM/cass, V8 DSL, A/C, \$1400 OBO. Glenn, x38067 or 484-4709.

'82 4WD Jeep Eagle wagon Ltd, 6 cyl, auto, all pwr, 75K mi, \$3000 OBO. x34213 or 286-7149.

'87 Jeep Cherokee Laredo, 4.0L, 5 spd, 2 dr, 4WD, 51K mi, red w/beige int, was \$9900, now \$8900. Dennis, x30417.

'89 Ford Probe GT Turbo, 5 spd, ex cond, \$11.5K. 457-2850.

'90 Chrysler LeBaron GT convert, under 9K mi, warr, red w/gray leather int, gray top, loaded, ex cond. Pat, x32661 or 485-5636.

'79 Ford Fairmont, rusty, runs great, \$600 OBO. x30333.

'83 Plymouth Turismo, 2 dr hatchback, ex cond, 62K mi, 5 spd, \$1500 OBO. Dennis, x34405 or 480-5076.

'81 Ford Escort wagon, body good cond, low mi, needs trans work, \$500. 482-1665.

'85 Ford Bronco, 4WD, auto, AM/FM, A/C, new eng/paint/trans, \$5300. 337-2671.

'89 Silverado Suburban, 27K mi, dual A/C, PS, PB, all pwr, Chevy radar det, draw title removable hitch, two tone blue, dark tint windows, 40 gal tank, assum, \$15,431. Dale, x39441 or 286-4624.

'75 Honda 550cc, rough but runs good, \$375 OBO. x30686.

'81 Honda 750 Custom Windjammer, radio, sissy bar, low mi, good cond, \$650 OBO. Bruce, 485-0396.

VF1000R Honda Interceptor, ex cond, low mi, \$3300. Brad, 485-1727.

Raleigh Tri-Lite, 19", 12 spd, quick release wheels, indexed gears, ex cond, \$250 OBO. Beatrice, 244-9755 or 335-1862.

Lg blue 10 spd bike, \$40. 337-3122.

'86 Honda 700 Magna, 7500 mi, ex cond, 2 helmets, \$2600. x38174 or 996-9526.

Yamaha RZ350 Sportbike, Spec II eng work, ported, expansion chambers, Mikunis, K&N's, Dunlops, \$2195 OBO. Hugo, 286-0432 or 335-2552.

'87 Honda Elite scooter, 80cc, red, 3200 mi, ex cond, \$800. 996-5165.

Two 20" boy's Schwinn bikes, \$50 ea. 896-1035.

Lady's 26" Murray Monterey cruiser bicycle, blue, ex cond, \$65 OBO. Jana, 326-4030 or 739-0500.

Boats & Planes

Clear Lake boat slip w/roof, motorized hoist for pwr boats, \$125/mo. 474-4922.

'76 Invader, twin hull, fish/ski, 65hp Merc, trlr, \$2000 OBO. 943-3305 or 487-2383.

San Francisco Bay Pelican 12' sailboat, galv trlr, \$600 OBO. 334-6515.

J24 sailboat, 24', great one design racer/cruiser, new 8hp O/B, 3 complete sets of sails, main, 150 Genoa, jib, spinnaker, trlr, \$9500 OBO. Glenn, 280-8644 or 282-3699.

New 25 hp Evinrude, elect start, \$1700. Jerry Craig, 283-5311 or 420-2936.

'15' Galaxie fibgl O/B walk thru, 70hp Johnson, \$1800. Gary, x32494 or 554-2023.

'89 VIP Vision, 128hp OMC I/OB, galv trlr, AM/FM stereo, 20 hrs, ex cond, ski equip, \$8150. 554-2392.

'79 Renegade 1540 ski boat, 140hp Evinrude, SST prop, custom trlr, new seats, carpet, paint, lgn sys, 45 mph, \$2500 OBO. 333-6668 or 486-7846.

'83 Renken 18' sailboat, roller furling jib, 4hp aux, galv trlr, sleeps 4, good cond, \$4000. 339-3476.

Audiovisual & Computers

Panasonic stereo cass deck, \$25; Phonemate answering machine, \$25; Polaroid SX-70 camera w/elec flash, \$50. 280-8181.

Nintendo game set, \$60; game cartridges, \$20. Steve, x32682 or 286-0638.

Realistic Micro-27 microcassette recorder, 2 spd capstan drive, voice actuated, fast playback, 7 blank tapes, \$58; B&K mod 290 elect multimeter, PR-21 probe, manual, \$150. Tom Clark, x49842.

IBM XT 640K computer, 30 MB HD, IBM CGA color monitor, math co-processor, \$575. x38135 or 326-1072.

Commodore 128/64 computer, dot matrix printer, color monitor, regular and muppet keyboard, SW incl, \$600. 286-8417 or 282-3399.

Today

Cafeteria menu—Special: fried chicken. Entrees: fried shrimp, baked fish, beef stroganoff. Soup: seafood gumbo. Vegetables: okra and tomatoes, buttered broccoli, carrots in cream sauce.

Monday

STS-1 anniversary—JSC will mark the 10th anniversary of the first space shuttle mission with a crew return celebration from 4:30-8:30 p.m. at the Gilruth Center. Call Ginger Gibson at x30596 or Cyndi Draughon at x30494 for more information.

Alumni League meets—The NASA Alumni League's JSC chapter will meet at 4:30 p.m. April 15 at the Gilruth Center in conjunction with the STS-1 10th anniversary celebration. For more information contact Jack Heberlig at 333-0928.

Lockheed NMA meets—The Lockheed National Management Association will present a brown bag luncheon at 11:40 a.m. April 15 in the Lockheed Plaza 4, Rm. 44F. "Present Economic Problems" will be the topic. For more information contact Charles Campbell at 333-6107.

Cafeteria menu—Special: meat sauce and spaghetti. Entrees: franks and sauerkraut, sweet and sour pork chop with fried rice, potato baked chicken. Soup: cream of potato. Vegetables: French beans, buttered squash, lima beans.

Tuesday

Cafeteria menu—Special: smo-

thered steak with dressing. Entrees: beef stew, liver and onions, shrimp Creole. Soup: navy bean. Vegetables: buttered corn, rice, cabbage, peas.

Wednesday

MAES symposium—The Society of Mexican American Engineers and Scientists will host its 1991 national symposium April 17-20 at the Stouffer Presidente Hotel in Houston. Highlights will include a Career Fair and Exhibit Center, Hispanic leadership workshops, petrochemical industry advances, technical paper presentations and professional development seminars. For more information, call Dalia Riojas at x33815.

AIAA luncheon—The American Institute of Aeronautics and Astronautics will meet at 11:30 a.m. April 17 at the Gilruth Center. The speaker will be Dr. John A. Neff, a nationally recognized expert in optical computing and other optical information processing applications. Cost: members and nonmembers: \$7; young members: \$6. For more information contact Zalar Taqui at 333-6544 or Richard Juday at x31486.

Astronomy seminar—The JSC Astronomy Seminar will be at noon April 17 in Bldg. 31, Rm. 129. Astronaut Jeff Hoffman will discuss the results of the Astro-1 mission. For more information contact Al Jackson, 333-7679.

Cafeteria menu—Special: salmon croquette. Entrees: roast beef, baked perch, chicken pan pie. Soup: seafood gumbo. Vegetables: mustard greens,

Italian green beans, sliced beets.

Thursday

Cafeteria menu—Special: stuffed cabbage. Entrees: beef tacos, ham and lima beans. Soup: beef and barley. Vegetables: ranch beans, Brussels sprouts, cream style corn.

Friday

Cafeteria menu—Special: Salisbury steak. Entrees: fried shrimp, deviled crabs, ham steak. Soup: seafood gumbo. Vegetables: buttered carrots, green beans, June peas.

April 20

Spring Star Party—The JSC Astronomical Society and Challenger-7 Memorial Park will host public telescope viewing of the stars and planets of spring from dusk to 9:30 p.m. April 20. Call Bill Williams at x33849 or 339-1367 for more information.

April 21

Spring concert—The Bay Area Chorus will present a spring concert at 3 p.m. April 21 at United Methodist Church of Pasadena. Tickets are available by calling 684-6030.

April 22

Lockheed NMA meets—The Lockheed National Management Association will present a brown bag luncheon at 11:40 a.m. April 22 in the Lockheed Plaza 4, Rm. 44F. "The Collapse of Communism in Europe and Africa," will be the topic. For more information contact Charles Campbell at 333-6107.

Microsoft QuickBasic 4.0, \$30; 1-2-3 compat spreadsheet SW, unopened, \$30. Martin, x47005 or 488-0949.

Pair of Advent Prodigy tower speakers, \$250; pair of Advent Baby II speakers, \$150; pair of Infinity shelf speakers, \$150. 996-1382.

Commodore 128 PC, 1571 disk drive, 1902 color monitor, joy-sticks, SW, 128 also runs 64 mode, \$450. Edward, 486-1093.

AT&T 6300 640K computer, 30 MB hard card, 2 360K FD, game port, game card, 8087 co-processor, color graphics monitor, \$700. Keith, x38024 or 554-4309.

JVC XLM600 compact disc player/changer, plays 6 discs in cartridge or 1 in tray, 12 cartridges incl, remote, 3 yr warr, \$300. x38370 or 471-3256.

Pair Bose 301 bookshelf speakers, ex cond, \$150. x38370 or 471-3256.

Cerwin-Vega HED-15 hi effc speakers, 100W, \$250 OBO. Steve, 282-4108 or 333-3176.

Apple ImageWriter II printer, \$300. 280-8796.

dishwasher w/Potscrubber, almond, built-in, needs repair, \$60. Magdi Yassa, x33479 or 486-0788.

Solid wood dinette set, \$100; 3 gold leaf LR tables, \$250; super single bed w/12 drwr storage, bookcase-mirror headboard, nightstand, \$175. x30972 or (409) 935-5688.

New Presto 6 qt elec Kitchen Kettle, plus crockery, \$20; new Rival Crock-ette 1 qt slow cooker, \$9. Kyle, x38628.

GE 25" color TV, ex picture, cable ready, oak cabinet, remote missing, \$120 OBO. Fred, 333-2166 or 282-4262.

Sears king sz Imperial Elite Plush matt and springs, 18 yr warr, ex cond, \$290. 486-8266.

Emerson AT1555 microwave, 1450W, turntable, temp probe, manuals, \$75. 326-1775.

Lg computer desk, hutch, shelves, locking cabinet, rolled edge, mahogany veneer, ex cond, \$95. Jeff, x31974 or 286-1938.

Bn contemporary couch, \$150; Lazy-Boy chair, rose, \$25. 283-5765 or 332-1725.

Wanted

Want Mac Plus computer w/ or w/o HD. 280-8796.

Want baby furniture incl dressing table, chest, etc. 488-5395.

Want window A/C, working or not, 110V or 220V, to \$75 for 110V, \$125 for 220V. 339-1337.

Want to lease 3-4 BR house near JSC, occupy May 29, '91, \$700-\$800 range, university prof. (205) 752-4909.

Want plastic or other scale models or kits of Cessna 172. 471-6158.

Want non-smoking fem roommate to share CLC house, \$275/mo plus 1/2 util. Sharon, x 33811 or 480-6173.

Want non-smoking roommate for 1 rm in Webster 3 BR, pet OK, \$250/mo plus 1/3 util. x34368 or 280-0802.

Want riding lawn mower, sliding glass door, alum windows. Bill, x39230.

Want old mechanical wrist watches, any cond. x30186.

Want Lark, Rascal or other mod elect drive cart. 488-6460 or 944-5615.

Want fully functional used elec stove w/accurate oven temp control, 27" drop-in or 30" floor mod, white. Ream, x32795 or 326-5746.

Miscellaneous

Two leather sided glass top coffee tables, \$50 ea; two 15" wire wheel covers, \$25 ea. James, 335-6710 or 482-6744.

Trek racing bike, good cond, \$200; Lynx USA titanium shaft 1 and 4 woods, \$25 ea; two pr Everlast boxing gloves, \$20; Wilson glove for sm child, 6-10, \$10. Steve, x37626.

Glass shelves, 14" x 36", 10" x 16", 20" x 22", etc. tempered 1/8" thick, x30686.

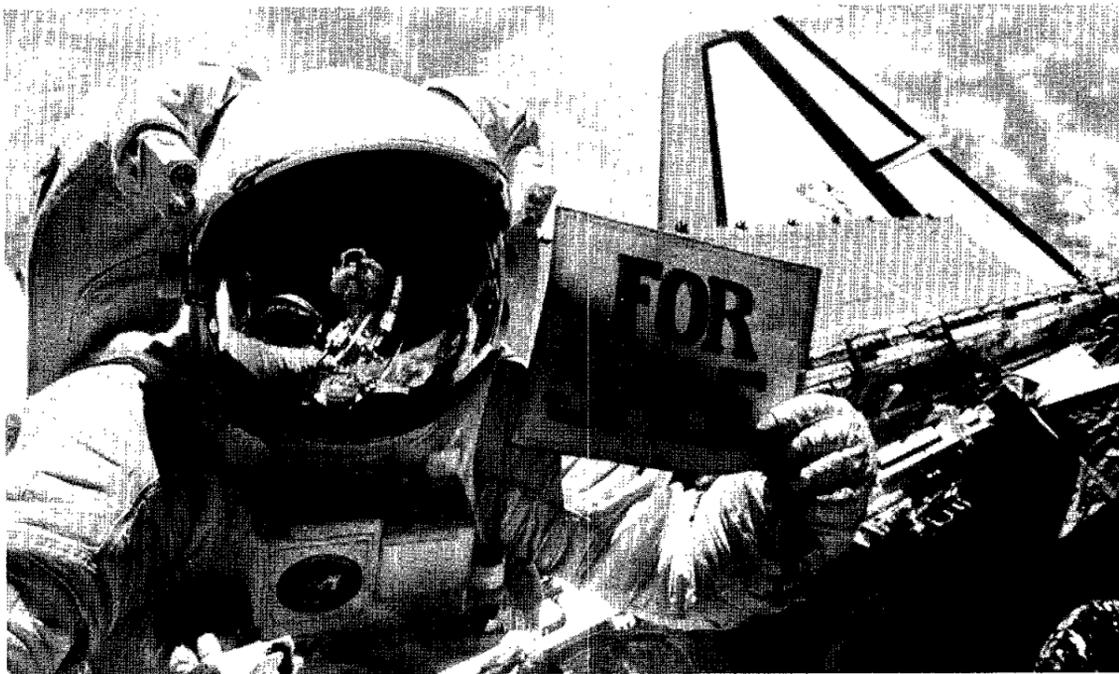
14' canoe trlr, \$350. 486-5220.

Sears rowing machine, \$75; Gympac weight machine w/bench, \$100. 482-7607.

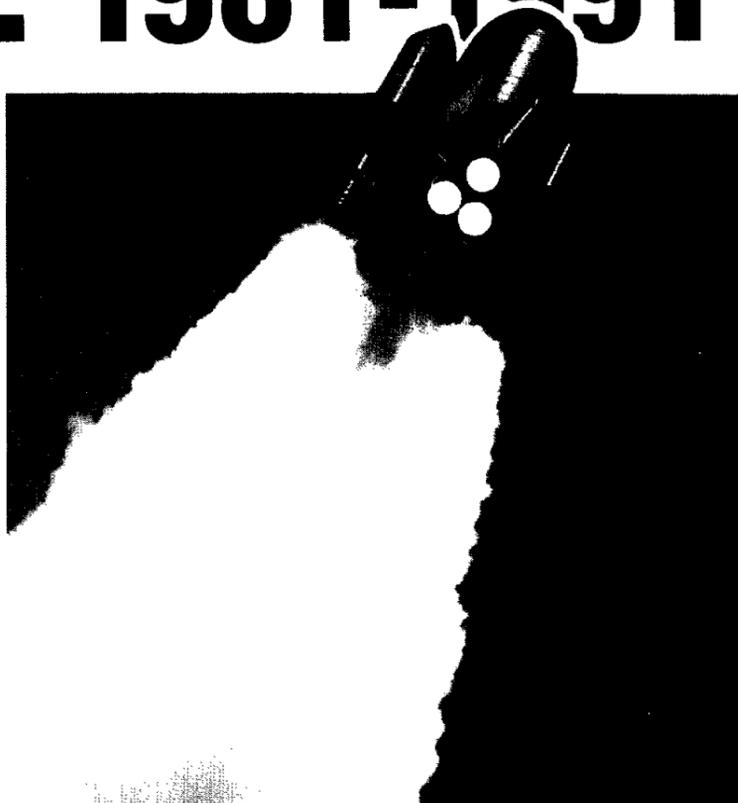
20" lawn mower, 3.5 hp, bag catcher, guns good, \$50 OBO. Ray, x38662 or 480-3387.

Sears Lifestyle cross country skier/rower, ex cond

A Decade of Flight: 1981-1991



▲ NOVEMBER 1984—STS-51A's Dale Gardner displays a "For Sale" sign after he and fellow space walker Joe Allen, reflected in Gardner's visor, had completed the first retrieval of two satellites on one mission. The pair spent more than 12 hours outside *Discovery* recovering the WESTAR-VI and PALAPA B-2 satellites.



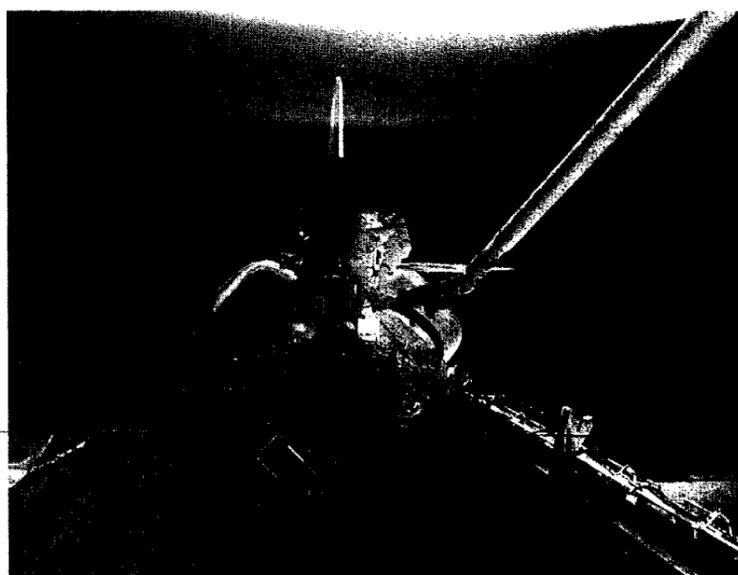
▲ APRIL 1991—The Space Shuttle *Atlantis* lifts off from Kennedy Space Center on STS-37. On board are Steve Nagel, Ken Cameron, Jerry Ross, Linda Godwin and Jay Apt.



▲ OCTOBER 1988—Three spacecraft communicators and a flight activity officer in Mission Control rate the STS-26 landing. *Atlantis'* mission, carrying Rick Hauck, Dick Covey, Mike Lounge, Pinky Nelson and Dave Hilmers, marked the return to flight following the *Challenger* accident. From left are CapComs Blaine Hammond, J. O. Creighton and Frank Culbertson, and FAD Neil Woodbury.



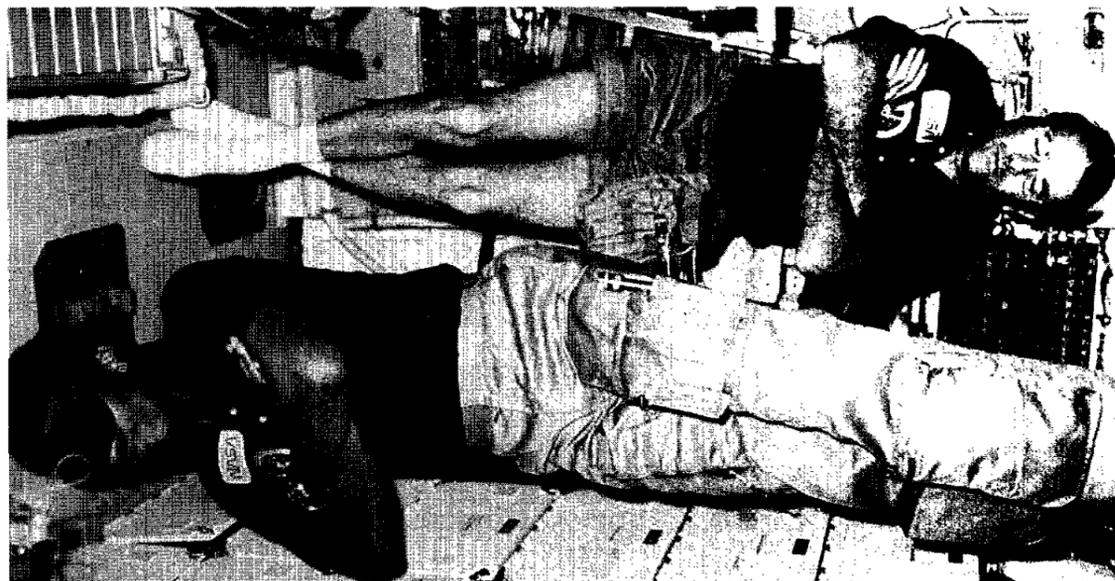
JUNE 1983—Sally Ride, the first American woman to fly in space, displays a tool set on *Challenger's* middeck during STS-7. Her crewmates on the six-day mission were Bob Crippen, Rick Hauck, John Fabian and Norm Thagard. ▶



▲ APRIL 1984—Space walkers Pinky Nelson and Ox Van Hoften use the manipulator foot restraint and *Challenger's* robot arm as a "cherry picker" during repairs of the captured Solar Maximum Mission satellite. The crew, which included Bob Crippen, Dick Scobee and Terry Hart, also deployed the Long Duration Exposure Facility.

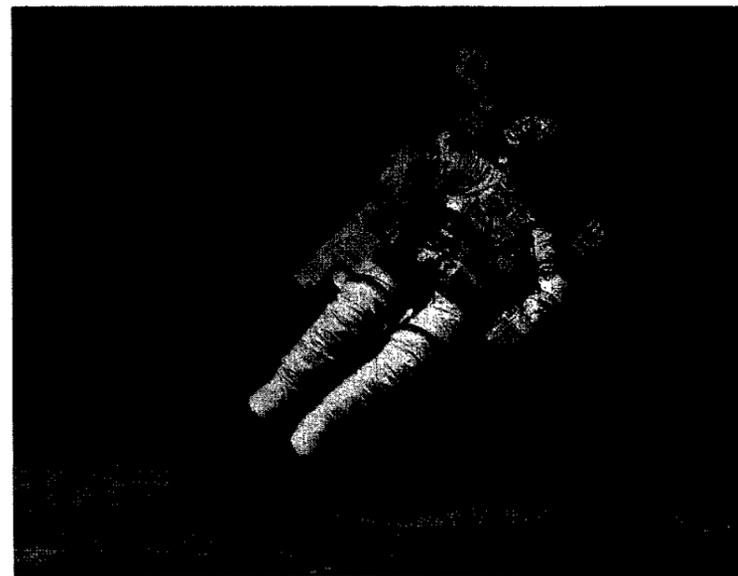


▲ NOVEMBER 1982—From the aft flight deck, Joe Allen gazes at the Earth below as a spot-meter floats free during STS-5. Allen, Vance Brand, Bob Overmyer and William Lenoir spent more than five days in orbit, deploying Satellite Systems-C and Telesat-E, the shuttle's first commercial communications satellites.



▲ AUGUST 1983—Richard Truly, top, and Guy Bluford, the first black American to fly in space, sleep on *Challenger's* middeck during STS-8. The crew, which also included Dan Brandenstein, Dale Gardner and Bill Thornton, deployed INSAT, the India Communications Satellite and tried out the Payload Flight Test Article/Payload Deployment Retrieval System.

FEBRUARY 1984—Bruce McCandless uses the Manned Maneuvering Unit space backpack on STS-41B. It was the first time a human being had flown in space untethered to his ship. McCandless, Vance Brand, Hoot Gibson, Robert Stewart and Ron McNair deployed the PALAPA B-2 and WESTAR-VI satellites from *Challenger* during their nearly eight days in orbit. ▶



Discovery up next; launch may be just weeks away

By James Hartsfield

With *Atlantis* now down, *Discovery* is up next with preparations for a launch perhaps less than two weeks away proceeding smoothly at Kennedy Space Center.

A tornado warning at KSC halted work at Pad 39A briefly Tuesday night, but preparations resumed within hours and managers will meet Monday and Tuesday to set an official launch date. *Discovery's* STS-39 payloads—the Air Force Program-675 and the Infrared Background Signature Survey mounted on the Shuttle Pallet Satellite-II—are installed in the payload bay and were serviced for flight this week.

Also, hypergolic propellants, fuels that ignite when they contact one another, were loaded into *Discovery's* orbital propulsion systems. The spacecraft's three main engines went through a final pre-flight test Wednesday, and the engine compartment is now being sealed.

Discovery will be commanded by Mike Coats. Blaine Hammond will serve as pilot, and mission specialists are Greg Harbaugh, Don McMonagle, Guy Bluford, Lacy Veach and Rick Hieb. Directing STS-39 operations from the ground will be Lead Flight Director

Ron Dittmore, who will oversee the Orbit 2 shift in Mission Control. Ascent and Entry Flight Director will be Lee Briscoe; Orbit 1 Flight Director will be Bob Castle; and Orbit 3 Flight Director will be Rob Kelso.

Work to prepare *Columbia* for a May launch on the Spacelab Life Sciences-1 mission

also is going well. This week, the Spacelab module was closed out for flight, and *Columbia's* payload bay doors were closed for the final time.

Other work included tests of the auxiliary

power units, radiator inspections, a hatch test, S-band antenna tests and finishing touches put on the thermal protection system tiles. *Columbia* is in Bay 1 of KSC's processing hangar.

In the Vehicle Assembly Bldg., the solid rockets that will boost *Columbia* on STS-40 are nearing completion and the shuttle's external fuel tank will be mated to them next week.

Atlantis, at Edwards Air Force Base, has an open hangar awaiting its return to Bay 2 of KSC's Orbiter Processing Facility. Fresh from space, *Atlantis* could arrive back at Kennedy as early as Wednesday.



JSC Photo by Tracy Singleton, a student at Landolt Elementary School, poses a question to the STS-37 crew by ham radio from JSC's Teague Auditorium. Also present were, from left, Gilbert Carman (seated), Joey Kramer, Bay Elementary; Kyle Beasley, Ross Elementary; Steven White, Ferguson Elementary; and Chuck Biggs, chief of JSC's Public Services Branch. Students from across the U.S. communicated with *Atlantis* through the Space Shuttle Amateur Radio Experiment.

Atlantis crew completes mission

(Continued from Page 4)

minutes, making the total STS-37 EVA time for Ross and Apt 10 hours, 49 minutes. That made Ross, with four career EVAs, the shuttle space walk record holder at 23 hours, 9 minutes.

But when Mission Control told him it was time to return to the crew compartment Monday, all Ross could say was "Rats."

Inside *Atlantis*, the crew managed numerous secondary payloads including the Space Station Heat Pipe Advanced Radiator Experiment (SHARE II), a clear plexiglass follow up to a similar experiment conducted during STS-29.

The experiments are part of a development investigation for a new

manifold design for that will use vaporized ammonia to radiate heat away from Freedom. SHARE II's Y-shaped manifold was an attempt to manage bubbles that blocked the T-shaped manifold on the original experiment. The crew said bubbles formed in the SHARE II manifold, but that they eventually stopped forming.

The crew also worked with the BioServe ITA Materials Dispersion Apparatus, designed to collect data for potential commercial applications of biomedical and fluid science processing in microgravity, and the Protein Crystal Growth Experiment series continued on STS-37, using bovine insulin in an attempt to grow larger, more perfect crystals that could

improve drug agents such as insulin for the treatment of diabetes.

The Shuttle Amateur Radio Experiment kept the airwaves buzzing throughout the mission, with hundreds of contacts between *Atlantis'* astronauts and ham radio operators throughout the world. The first television picture was received on board a spacecraft by way of the fast scan television mode.

All licensed ham operators, the crew members also made at least partial contact with the Soviet Mir space station. Those on *Atlantis* were able to hear the Mir cosmonauts, but were not able to confirm whether their transmissions were received on Mir.

STS-1 anniversary celebration at Gilruth follows round-table discussion in Teague

(Continued from Page 1)

all major intersections along the route.

All gates except Gate 2 (at Third Street and NASA Road 1) and Gate 5 (Avenue E west, Saturn Lane) will be open until about 9:30 p.m. Employees will be directed to available parking as they enter the center.

JSC Director Aaron Cohen will host an STS-1 round-table from 1-3 p.m. in Teague Auditorium, just before the crew return celebration.

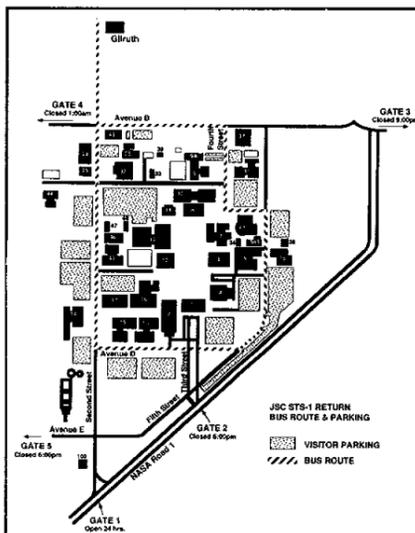
The lineup of participants, representing their functions from that time, is expected to include John Yardley, associate administrator for manned space flight, 1974-81; Robert Thompson, space shuttle program manager, 1970-1981; Aaron

Cohen, space shuttle orbiter project manager, 1972-1982; Christopher C. Kraft Jr., JSC director, 1972-1982; STS-1 crew members John Young and Robert Crippen; and STS-1 backup crew and STS-2 crew members Joe Engle and Richard Truly.

JSC Public Affairs Director Harold Stall will be master of ceremonies.

Each panel member will be asked to spend five to 10 minutes recalling the events leading up to STS-1, sharing their personal highlights of the flight and giving their perspective 10 years later. If time permits, the panel will field questions from the audience.

Ticket sales will continue through 2:00 p.m. today.



Sonny Carter leaves scientific legacy

(Continued from Page 1)

things in his short military career than the selected few could do in a lifetime. . . I am certain that Dana thought that she was just marrying a country doctor. Only God knows where he would have gone next."

Carter was born Aug. 15, 1947, in Macon, Ga., and grew up in nearby Warner Robins, Ga. In 1969, he received a bachelor of arts degree from Emory University, and continued his studies at Emory University Medical School, graduating in 1973.

Dr. Deborah Harm, project scientist for the Preadaptation Trainer being developed to help astronauts adapt more easily to space flight, said other astronauts will reap the benefits of his work on that project for years.

"Sonny had an incredibly strong interest in understanding all the physiology of what happens in space flight and coming back," she said.

"He would do anything to his body to increase man's knowledge of this unknown," added Gregory. "Because of Sonny's dedication, medical science research now plays a significant role to determine mission duration."

Carter was deeply involved in the project from its beginnings two years ago, Harm said, encouraging fellow astronauts to participate and providing in-depth, constructive advice.

"He was one of the nicest people I've worked with anywhere, under any circumstances," she said.

While enrolled in medical school, Carter played professional soccer for the Atlanta Chiefs of the North American Soccer League. He loved baseball, and in 1988 his friends in the astronaut corps sent him to the Los Angeles Dodgers' adult baseball camp.

In 1974, the Eagle Scout entered the U.S. Navy and completed flight surgeon school. After serving as a flight surgeon with the 1st and 3rd Marine Air Wings, he received his Naval Aviator wings in 1978. Carter was senior medical officer aboard the USS *Forrestal* and later served as an F-4 fighter pilot with Marine Attack Squadron 333 and Marine Fighter Attack Squadron 115.

A graduate of the U.S. Navy

Fighter Weapons School (TOPGUN) in 1982 and the U.S. Navy Test Pilot School in 1984, Carter logged more than 3,000 hours and made 160 carrier landings.

"Sonny was an incredibly active and vital man," said his wife. "Above all, he was a warm and loving husband and father. In addition to his professional career, Sonny dedicated himself to numerous charitable activities."

The Sonny Carter Memorial Scholarship Fund has been set up in care of the Astronaut Office, CB, Johnson Space Center, Houston, 77058. Donations also may be made in Carter's name to the Boy Scouts of America and sent to the same address.

Gardner new test pilot school commandant

Col. Guy S. Gardner will leave the astronaut corps in June to become commandant of the Air Force Test Pilot School at Edwards Air Force Base, California.

His new position, which is a part of the Air Force Systems Command, was announced Wednesday.

Gardner was pilot on two space shuttle missions, STS-27, a Department of Defense flight aboard *Atlantis* in December 1988, and STS-35, which carried the ASTRO-1 astronomy laboratory aboard *Columbia* in December 1990. He has worked at NASA Johnson Space Center since his selection as an astronaut candidate in May 1980.

After graduating from the Test Pilot School in 1975, Gardner served as a test pilot with the 6512th Test Squadron and then as an instructor test pilot at Edwards.

"We are happy that Guy has this outstanding opportunity, said David Leestma, deputy director of Flight Crew Operations. "Although we'll miss his expertise here, we will look forward to working with him in his new assignment."



Civilians in space program still holding

NASA Administrator Richard H. Truly has decided, based on a recent policy review, that NASA's Space Flight Participation Program will remain on hold for another year.

Under the program, NASA would provide space flight opportunities for people outside the professional categories of NASA astronauts and payload specialists.

When the program resumes, NASA plans to give first priority to sending a teacher into space in fulfillment of space education plans.

Truly made the decision based on the recommendation of a policy review committee of senior officials at NASA Headquarters. The group expressed support for the Teacher-in-Space program following an April 1 meeting. However, the group felt that it would be premature to reinstate activities in 1991 because of the continuing backlog of high priority missions on the shuttle manifest. A policy review on reinstatement of the program will be repeated early next year.

Christa McAuliffe, the first teacher in space, was part of the STS-51L crew on the Space Shuttle *Challenger* which was lost on Jan. 28, 1986.

Barbara Morgan, a teacher from McCall, Idaho, was named NASA's Teacher-in-Space designee in 1986 when she was chosen as the next space flight participant to fly on the shuttle when the program resumes.

Morgan has completed initial training and has maintained her proficiency.

Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

Correction

A typographical error on Page 4B of today's space shuttle 10th anniversary edition, makes an important shuttle launch statistic incorrect. The quote by Joe Loftus, JSC assistant director for plans, should read: "The shuttle, with 4 percent of all U.S. launches, has launched 41 percent of all the mass. Not including the orbiter."

NASA-JSC